Liaohai Chen

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Education

Postdoc 1997 - 1999 Biophysics, Los Alamos National Laboratory, NM

Ph.D 1995 - 1997 Organic Chemistry, University of Rochester, NY

M.S. 1993 - 1995 Organic Chemistry, University of Rochester, NY

B.S. 1983 - 1987 Chemistry, Zhejiang University, China

Research and Professional Experience

Molecular Biologist and Group Leader, 2/2005 ---
Biosciences Division, Argonne National Laboratory

Associate Professor, 7/2006 ---
Department of Obstetrics and Gynecology
Rush University Medical Center

Assistant Molecular Biologist, 6/2001-2/2005
Biosciences Division, Argonne National Laboratory

Adjunct Faculty, 11/2004 --- 06/2006
Department of Obstetrics and Gynecology
Rush University Medical Center

Technical Staff Member, 12/1999-6/2001
Bioscience Division, Los Alamos National Laboratory.

Research Associate, 10/1987 - 08/1993
Dalian Institute of Chemical Physics, Chinese Academy of Science

Publications
(Peer reviewed)

John T. Bahns, Funing Yan, Dengli Qiu, Rong Wang and Liaohai Chen "Hole-Enhanced Raman Scattering" *Applied Spectroscopy*, 2006, to be published, August, 2006.

Yuexing Zhang, John T. Bahns, Qiaoling Jin, Ralu Divan, and Liaohai Chen **"**Towards the Detection of Single Virus Particle in Serum", *Analytic Biochemistry*, 2006, to be published in August 2006.

PASCALE EHRENFREUND, STEEN RASMUSSEN, JAMES CLEAVES and LIAOHAI CHEN "Experimentally tracing the Key steps in the origin of Life: The Aromatic World", *ASTROBIOLOGY*, 2006, Vol. 6, No. 3: 490-5203.

Chinmei Liu, Seok-Hwan Chung, Qiaoling Jin, April Sutton, Funing Yan, Axel Hoffmann, Brian K. Kay, Samuel D. Bader, Lee Makowski and Liaohai Chen "Magnetic viruses via nano-capsid templates"**,** *Journal of Magnetism and Magnetic Materials*, **2006**, 302, 47-51.

S.-H. Chung, A. Hoffmann, K. Guslienko, S. D. Bader, C. Liu, B. Kay, L. Makowski, and L. Chen**,** Biological sensing with magnetic nanoparticles using Brownian relaxation (invited), *J. Appl. Phys.* 2005, **97**, 10R101.

Chin-Mei Liu, Qiaoling Jin, April Sutton, and Liaohai Chen, A novel fluorescent probe: Europium complex hybridized T7 phage, *Bio-conjugation Chem.* **2005**, 16, 1054 -1057.

K. E. Achyuthan, T. S. Bergstedt, L. Chen, R. M. Jones, S. Kumaraswamy, S. A. Kushon, K. D. Ley, L. Lu, D. McBranch, H. Mukundan, F. Rininsland, X. Shi, W. Xia and D. G. Whitten Fluorescence superquenching of conjugated polyelectrolytes: applications for biosensing and drug discovery *Journal of Materials Chemistry*, 2005, 15, 2648–2656.

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Qiling Tang, Yuexing Zhang, Liaohai Chen, Funing Yan and Rong Wang Protein delivery with nanoscale precision *Nanotechnology* (2005) **16** 1062-1068.

Dalvi-Malhotra, J.; Chen, Liaohai Enhanced Conjugated Polymer Fluorescence Quenching by Dipyridinium-Based Quenchers in the Presence of Surfactant *J. Phys. Chem. B. ;* 2005**;** *109*(9); 3873-3878.

Funing Yan, Qiling Tang, Rong Wang, and Liaohai Chen, "Synthesis and characterization of a photo-cleavable cross-linker and its application on tunable surface modification and protein photo-delivery", *Bio-conjugation Chem.* 2004, 15,1030-1036.

John T. Bahns, Chin-Mei Liu, and Liaohai Chen, "Characterizing specific phage-protein interactions by fluorescence correlation spectroscopy" *Protein Science* 2004, 13, 2578-2587.

S. H. Chung, A. Hoffmann and S. D. Bader, C. Liu, B. Kay and L. Makowski and Liaohai Chen, "Biological sensors based on Brownian relaxation of magnetic nanoparticles" *Apply Phys. Lett.*, 2004, 85, 2971-2973.

Rong Wang, Jeane Shi, Atul N. Parikh, Andrew P. Shreve, Liaohai Chen and Basil I. Swanson "Evidence for cholera aggregation on GM1-decorated lipid bilayers", *Colloids and Surfaces B: Biointerfaces,* 2004 (33) 45-51

Steen Rasmussen, Liaohai Chen, Barbel Stadler and Peter Stadler, "Proto-organism kinetics: evolutionary dynamics of lipid aggregates with gene and metabolism", *Origins of Life and Evol. of The Biosp. 2004 (34), 171.*

Steen Rasussen, Liaohai Chen, David Deamer, David Krakauer, Norman Packard, Peter Stadler and Mark Bedau "Transitions from nonliving to living Matter" *Science* 2004 (303), 963-965.

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Hsing-lin Wang, Duncan McBranch, Liaohai Chen, Fred Wudl "Highly efficient energy and charge transfer in thin self-assembled mutilayered polymer films" *Synthetic Metals*, (2001), 121, 1367.

Liaohai Chen, Su Xu, Duncan McBranch, and David Whitten "Tuning the Properties of Conjugated Polyelectrolytes Through Surfactant Complexation" *J. Am. Chem. Soc.* (2000), 122, 9302-9303.

Liaohai Chen, Rong Wang, Duncan McBranch, and David Whitten "Surfactant-Induced Modification of Quenching of Conjugated Polymer Fluorescence by Electron Acceptors: Applications for Chemical Sensing" *Chem. Phy. Lett.* (2000), 330, 27-33.

Rong Wang, Cristina Geiger, Liaohai Chen, Basil Swanson, David G. Whitten "Direct Observation of Sol-Gel Conversion: the Role of the Solvent in Organogel Formation" *J. Am. Chem. Soc.* (2000), 122(10), 2399-2400.

Liaohai Chen, Cristina Geiger, Jerry Perlstein and David G. Whitten "Self-Assembly of Styryl Naphthalene Amphiphiles in Aqueous Dispersions and Interfacial Films: Aggregate Structure, Assembly Properties, Photochemistry and Photophysics*" J. Phys. Chem. B* (1999), 103(43), 9161-9167.

Cristina Geiger, Marina Stanescu, Liaohai Chen, and David G. Whitten Organogels Resulting from Competing Self-AssemblyUnits in the Gelator: Structure, Dynamics, and Photophysical Behavior of Gels Formed from Cholesterol-Stilbene and Cholesterol-Squaraine Gelators, *Langmuir (*1999)**,** *15,* 2241-2245.

Liaohai Chen, Duncan W. McBranch, Hsing-Lin Wang, Roger Helgeson, Fred Wudl, and David G. Whitten "Highly-Sensitive Biological and Chemical Sensors Based on Reversible Fluorescence Quenching in a Conjugated Polymer" " *Proc. Nat. Acad. Sci.* (1999), 22, 12287-12292.

Whitten, David G.; Liaohai Chen; Geiger, H. Cristina; Perlstein, Jerry; Song, Xuedong. "Self-Assembly of Aromatic-Functionalized Amphiphiles: The Role and Consequences of Aromatic-Aromatic Noncovalent Interactions in Building Supramolecular Aggregates and Novel Assemblies" Feature Article *J. Phys. Chem. B* (1998), 102(50), 10098-10111.

Liaohai Chen; Lucia, Lucian A.; Gaillard, E. R.; Whitten, David G.; Icil, H.; Icli, S. "Photooxidation of a Conjugated Diene by an Exciplex Mechanism: Amplification via Radical Chain Reactions in the Perylene Diimide-Photosensitized Oxidation of α-Terpinene" *J. Phys. Chem. A* (1998), 102(45), 9095-9098.

Lucia, Lucian A.; Wyrozebski, Kataryna; Liaohai Chen; Geiger, Cristina; Whitten, David G. **"**Electron Transfer Photofragmentation Reactions in Monolayer Films at the Air/Water Interface" *Langmuir* (1998), 14(13), 3663-3672.

Liaohai Chen; Lucia, Lucian; Whitten, David G. **"**Cooperative Electron Transfer Fragmentation Reactions. Amplification of a Photoreaction through A Tandem Chain Fragmentation of Acceptor and Donor Pinacols" *J. Am. Chem. Soc*. (1998), 120(2), 439-440.

Liaohai Chen; Farahat, Mohammad S.; Gaillard, Elizabeth R.; Farid, Samir; Whitten, David G. **"**Photoinduced Electron Transfer Double Fragmentation: an Oxygen-Mediated Radical Chain Process in the Co-fragmentation of Substituted Pinacol Donors with Carbon Tetrachloride" *J. Photochem. Photobiol., A* (1996), 95(1), 21-5.

Liaohai Chen; Farahat, Mohammad S.; Gan, Hong; Farid, Samir; Whitten, David G. **"**Photoinduced Electron Transfer Double Fragmentation: An Oxygen-Mediated Radical Chain Process in the Cofragmentation of Aminopinacol Donors with Organic Halides" *J. Am. Chem. Soc.* (1995), 117(23), 6398-6399.

Liaohai Chen, Wanzhen Gu et al. " Highly Efficient Hydrogen and Ethylene Glycol Photoproduction From Aqueous Methanol Solution by ZnS and an in Situ Spin Trapping Investigation " *J. Photochemistry and Photobiology: A. Chem*: (1993), 74, 85-89.

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Patents

Liaohai Chen, A. Hoffmann, S. D. Bader, B. Kay and L. Makowski **"**Inorganic hybridized phage" US patent filed March 21, 2005

Chen, Liaohai "Enhanced photophysics of conjugated polymers" US patent (*2003) 0224525*.

Chen, Liaohai; Xu, Su; McBranch, Duncan; Whitten, David. "Enhanced photophysics of conjugated polymers, complex with surfactants, their manufacture and fluorescent propertie" U.S. Patent (2003) 6569952.

Chen, Liaohai, "Tuning the properties of ionic conjugated polymer with polyelectrolytes and application in a biosensor platform". Patent number WO (2002) 2002079268.

Chen, Liaohai; McBranch, Duncan W.; Wang, Hsing-Lin; Whitten, David G. "Method for detecting biological agents". Patent number WO (2000) 2000066790. The patent has led to the establishment of QTL Biosystems at Santa Fe, New Mexico and the sensor device was the candidate for 2000 R&D 100 award.

Book Chapter

Axel Hoffmann, Seok-Hwan Chung, Samuel D. Bader, Lee Makowski and Liaohai Chen, Chapter 1, BROWNIAN MOTION IN BIOLOGICAL SENSING. *BIOMEDICAL APPLICATIONSOF NANOTECHNOLOGY,* A JOHN WILEY & SONS, INC., 2005

David Whitten, **Liaohai Chen**, Robert Jones, and Peter Heeger Chapter 4: From Superquenching to biodetection: Building sensors based on fluorescent polyelectrolytes *Optical Sensors and Switches,* Marcel Dekker, Inc. 2001.

Selected Invited Talks at Major Symposium

"A lipid based "genetic" self-replicated system", International Symposium for Programmable Artificial Cell Evolution, sponsored by Europe Commission, Venice, Italy, April 5-8, 2004.

"Bridging nonliving and living matter" International Workshop for Bridging nonliving and living matter, Santa Fe Institute, Santa Fe, September 9-11, 2003.

"Sensors based on resonant oscillation of magnetic phage", BioMagnetICs Symposium, Sponsored by Department of Defense, Coronado, CA, July 9-11, 2003.

"Bridging nonliving and living matter", Astrobiology Science Conference 2002 sponsored by NASA, NASA Ames Research Center, April, 2002.

"Novel Biosensors Based on Nanosized Conjugated Polymer: Detection of Hepatitis C Virus and Broken DNA Strand". Symposium for DOE OBER Contractors, Albuquerque, May, 2000.

"Novel Super Quenching Behavior Between a Conjugated Polymer and Molecular Quenchers and its Application in Biological and Chemical Sensors" SPIE International Symposium on Environmental and Industrial Sensing, Boston, September 1999.

"Highly-Sensitive Biological and Chemical Sensors Based on Reversible Fluorescence Quenching in a Conjugated Polymer" XIX International Conference on Photochemistry, Durham, NC, August 1999.

"Self-Assembly of Styryl Naphthalene Amphiphiles in Aqueous Dispersions and Interfacial Films: Aggregate Structure, Assembly Properties, Photochemistry and Photophysics" Second US-Japan Binational Symposium, Laguna Beach, CA, March 1999.

Other Selected Invited Talks:

"*Nano-Bio: Shaping Biomedical and Material Science Research*" Argonne Partnership Committee, Argonne National Laboratory, October 18, 2004.

"*Ionic Conjugated Polymer: From Super Quenching to Sensing"*, Chemistry Division seminar; Chemistry Division, Argonne National Laboratory, September, 22, 2003.

"From Superquenching to Biodetection" by Liaohai Chen, Department Seminar, Department of Biological, Chemical and Physical Sciences, Illinois Institute of Technology" September, 12, 2002.

Selected Contributed Posters and Talks

"Compartmentalization of Phage Solution for Phage Sorting and Single Phage Display", Annual Conference of Great Lakes Regional Center of Excellence. Evanston, IL, December, 13, 2003.

"Synthesis of a Universal Photolabile Cross-Linker and Its Application in AFM Imaging", 225th *American Chemical Society National Meeting*, March 23, 2003.

"Biosensors Based on Fluorescent Conjugated Polymers" NIH Symposium for Nanoscience and Nanotechnology: Shaping Biomedical Research, Bethesda, June, 2000.